

Application No.: 10/586,174
Amendment Dated: December 29, 2008
Reply to Office Action of: September 30, 2008

MAT-8868US

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A power supply device comprising:
 - a capacitor unit in which capacitors are interconnected in series or in series-parallel;
 - a charging unit for charging the capacitor unit at a constant current;
 - a detecting unit for detecting voltage on a high potential side of each capacitor;
 - a determining unit for determining existence of an abnormality by performing calculation based on the voltage detected by the detecting unit; and
 - a communication unit for outputting a determining result from the determining unit,

wherein

the determining unit determines the abnormality is adapted to determine that a capacitor of the capacitor unit is abnormal based on at least two of the following conditions:

- a) over-voltage abnormal condition when a difference between respective voltages on the high potential side of some the capacitor and an adjacent capacitors series capacitor exceeds upper-limit voltage "Va",
- b) under-voltage abnormal condition when the difference between respective voltages on the high potential side of the capacitor and the adjacent series capacitor is lower than lower-limit voltage "Vb", and
- c) negative voltage abnormal condition when a voltage value on the high potential side of the capacitor is negative, and negative.

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~~the determination is forbidden just after start of the charge of the capacitors, and the determination is started at the time when charge voltage Vc of the capacitor unit is at most a predetermined voltage value "Vd".~~

2. (Cancelled).

3. (Original) The power supply device according to claim 1,

wherein lower-limit voltage value "Vb" is expressed by

$$Vb = Vc / (2N),$$

where "Vc" is a charge voltage value of the capacitor unit and "N" is series number of the capacitors.

4. (Currently Amended) The power supply device according to claim 1,

~~wherein the determination is started at the time when a unit starts determining if the capacitor in the capacitor unit is abnormal after charging has begun, and before charge voltage value "Vc" of the capacitor unit is at most exceeds a predetermined voltage value "Vd".~~

5. (Previously Presented) The power supply device according to claim 1,

wherein the predetermined voltage value "Vd" is expressed by

$$Vd = Vt \times \{ 1 + (N - 1 - M) \times (1 - dev) / (1 + dev) \} - \alpha,$$

where "Vt" is a withstand voltage value per capacitor cell, "dev" is a capacity variation of the capacitors, "N" is series number of capacitors, "M" is the number of series stages including short-failed capacitors, and " α " is a detection error margin.

6. (New) The power supply device according to claim 1,

wherein the upper-limit voltage is set as a withstand voltage value per one cell of the capacitors.